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LaCroix Davis LLC

California State Board of Equalization
450 N Street, Sacramento, California

Monthly Air Monitoring Report
March 2012

Project No. 2372.02-572

Prepared for:
California Department of General Services
707 Third Street, 3-305
Sacramento, California 95605

Prepared by:
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Report Date:
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TABLE OF CONTENTS

TABLES

APPENDICES

1.0 Introduction

On July 2, 2008, LaCroix Davis LLC (LCD) was contracted by the State of California, Department of General Services (DGS), Real Estate Services, Project Management Branch (RES, PMB) to provide building and environmental forensic services at the Board of Equalization (BOE) building located at 450 N Street, Sacramento, California. The BOE building was substantially completed in December 1992 and has experienced a variety of water-related events throughout its history.

On September 30, 2011, LCD's original contract was amended by Contract Amendment 3126150 Am. 7 to include the following Monthly Air Monitoring activity:

> "Contractor shall provide monthly (once per month) air monitoring of the building during that portion of the day in which the building HVAC system is fully-operational. Eleven (11) floors will be monitored per month starting with the even-numbered floors on the first month that monthly air monitoring starts, and then switching to the odd-numbered floors on the following month. Switching between even and odd-numbered floors will continue during successive months; resulting in a total of 12 sampling events throughout a 12-month period: six (6) sampling events on even-numbered floors and six (6) sampling events on odd-numbered floors.
>
> Services shall include a monthly sampling event as follows:
>
> a. Two (2) samples per tenant floor (22 total), four (4) outdoor samples, and two (2) field blanks; and analysis by Polymerase Chain Reaction (PCR) for Custom Cladosporium Panel and PCR-23 Panel;
> b. All samples shall be analyzed using laboratory standard turnaround times unless directed to do otherwise by DGS."

Under the project management of Mr. Chris Corpuz, Senior Manager, the LCD field project team was staffed by personnel from various LCD offices.

The industrial hygienists (IH) proposed a re-occurring air sampling date and submitted it to BOE for approval; BOE has approved the last Friday of every month for the monthly air monitoring. BOE notified the Building Security that the IHs would require escorts onto secure floors in order to install sampling pumps.

2.0 Air Monitoring

On behalf of DGS, the LCD team performed air monitoring in accordance with the Monthly Air Monitoring Schedule and Revised Protocol, Rev. 3 (Attachment A) on March 30, 2012. During that time, the building HVAC system operated from 5:00 AM to 6:00 PM. Therefore, the sampling window was from 4:00 AM to 7:00 PM for sample set-up and three rounds of sampling on each floor. (The actual sampling window will be changed as seasonal adjustments are made to the HVAC system operating window.)

LCD collected three (3) air samples on each of the eleven (11) even-numbered floors designated for the March monitoring. Each air sample was drawn over approximately 2 to 3 hours. The first sample was started at 5:42 AM; the last (third) sampling event time ended by 6:26 PM. A target sample rate of 7 liters per minute (LPM) was used.

LCD also collected a total of three (3) exterior/outdoor samples; one (1) sample was taken per sampling period. In addition, one (1) lab blank was submitted for analysis.

A total of 33 interior samples, three (3) exterior samples, and one (1) lab blank were submitted under chain of custody to the laboratory and analyzed for PCR – Cladosporium (custom panel). The exterior samples, the lab blank, and one (1) sample per floor were also analyzed for PCR-23 Important Indoor Molds. The analytical results are summarized in Table 1. The lab reports are included in Appendix B, Lab Reports.

Each sample is calibrated before and after each sampling period. Floor 10 sample number 2372-03012-P31 was properly calibrated, but showed evidence of intentional tampering, resulting in this sample being voided. The flow control dial was turned fully clockwise to its "closed" position sometime after the pump was first calibrated.

The Mechanical Floor, the Penthouse Floor, and the core sampling ports on Floors 2 and 21 are not part of the monthly monitoring schedule. At the direction of the DGS management team, samples from these areas may be added to the regular schedule. However, no indoor air samples were added and collected from either one of these locations during this monthly monitoring event in March 2012.

To demonstrate any seasonal changes within the HVAC duct interiors, surface microvac samples – not part of the regular sampling project schedule – may be added to the regular schedule. However, no microvac samples were collected during the monthly monitoring event in March 2012.

3.0 Findings

In general, the indoor air samples indicated spore equivalents (SE) below background concentrations detected in outdoor samples. In three locations total (one each on Floors 4, 14 and 20), samples indicated the presence of 18 or less spore equivalents (SE) of *Aspergillus versicolor*, whereas this species was not detected in the background samples. Two SE of *Aspergillus flavus* was detected at one location on Floor 20, but not in the background samples. Low SE values can be an indication of mold debris and do not necessarily indicate the presence of mold spores. Based on historical monitoring of these areas, the detections appear to be isolated events and unremarkable, but will be checked against future samples collected in these areas.

Based on the March 2012 monitoring results, molds detected in the HVAC ducts do not appear to have impacted the air quality of the office spaces.

4.0 Limitations and Qualifications

The assessment performed by LCD does not include or cover the following matters: Matters that are subsequently discovered that could not have been reasonably foreseen or detected, using industry standards, during the performance of the assessment; matters that could not have been discovered by LCD because of barriers, lack of access or other matters affecting accessibility; matters that were not disclosed to LCD prior to, during, or after the performance of the assessment; any new deficiency that arose after the completion of the assessment by LCD.

To the extent that additional information becomes available to LCD, LCD reserves the right (without any obligation to do so) to modify its evaluation and/or this report at any time, based upon further review and analysis of any such additional information or data.

Certain items mentioned in the report were performed by others not involving the supervision of, or management by, LCD, but were relied upon by LCD in making its evaluation and assessment.

The assessment performed by LCD is not meant or intended to supplement, modify, or extinguish any warranty or representation made or given by third parties performing any of the recommended corrective work.

When consultation involves microbiological growth, or any assessment thereof, such microbiological growth may reoccur if the source of the growth is not remedied. All remediation of fungi in indoor environments can be inherently limited in the sense that conclusions are drawn and recommendations developed from information obtained from limited research and site evaluation. Except as may be noted in the assessment performed by LCD, subsurface areas, latent defects, or non-accessible areas and conditions were not field investigated and may differ from the conditions implied by the surface observations. Additionally, the passage of time may result in a change in the environmental characteristics at the subject property and the surrounding properties. No investigation or assessment can absolutely rule out the existence of any microbiological growth at any given site. LCD does not remediate or remedy sources of microbiological growth.

This Report and the assessment/survey conducted by LCD is prepared, and was performed, solely for the use and benefit of the client identified at the beginning of this report. No other party may rely on this report for any other purpose.

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LaCroix Davis LLC

Table 1 - March 2012 Air Monitoring Results

Board of Equalization Building, Sacramento

LCD No. 2373.03-572
DGS-BOE
Monthly Air Monitoring

Location	Sample Number	PCR - Custom Panel Cladosporium						PCR - 23 Important Indoor Molds (Only species detected indoors this month are listed.)															
		Cladosporium sphaero-spermum		*Cladosporium herbarum*		*Cladosporium cladospo-rioides II*		*Cladosporium cladospo-rioides I*		*Alternaria alternata*		*Aspergillus flavus*		*Aspergillus fumigatus*		*Aspergillus niger*		*Aspergillus versicolor*		*Eurotium amstelodami*		*Penicillium brevicom-pactum*		*Penicillium crysogenum*	
		SE	SE/m^3	SE	SE/m^3	SE	SE/m^3	SE	SE/m^3	SE	SE/m^3	SE	SE/m^3	SE	SE/m^3	SE	SE/m^3	SE	SE/m^3	SE	SE/m^3	SE	SE/m^3	SE	SE/m^3
Floor 24 NW	2372-33012-P02	ND	<1	ND	<1	ND	<1	1	1	ND	<1	ND	<1	ND	<1	ND	<1	ND	<1	ND	<1	ND	<2	ND	<1
Floor 24 SE	2372-33012-P13	ND	<1	1	1	ND	<1	10	7																
Floor 24 N	2372-33012-P25	1	1	5	3	1	1	14	10																
Exterior 23 W	2372-33012-P14	ND	<1	92	64	7	5	660	460	ND	<1	ND	<1	7	5	15	10	ND	<1	ND	<1	24	17	ND	<1
Floor 22 S	2372-33012-P03	ND	<1	2	2	1	1	1	1																
Floor 22 W	2372-33012-P15	ND	<1	1	1	1	1	11	8	2	1	ND	<1	ND	<1	ND	<1	ND	<1	ND	<1	ND	<2	ND	<1
Floor 22 E	2372-33012-P26	ND	<1	2	1	ND	<1	150	110																
Floor 20 SW	2372-33012-P04	ND	<1	1	1	ND	<1	3	2																
Floor 20 NW	2372-33012-P16	1	1	1	1	1	1	14	10																
Floor 20 NE	2372-33012-P27	1	1	1	1	1	1	40	29	ND	<1	2	1	ND	<1	ND	<1	18	14	ND	<1	ND	<2	ND	<1
Floor 18 NW	2372-33012-P05	ND	<1	1	1	ND	<1	11	8																
Floor 18 SW	2372-33012-P17	ND	<1	1	1	ND	<1	13	9	ND	<1	ND	<1	ND	<1	ND	<1	ND	<1	ND	<1	ND	<2	3	2
Floor 18 E	2372-33012-P28	ND	<1	1	1	1	1	8	5																
Floor 16 SW	2372-33012-P06	ND	<1	ND	<1	ND	<1	60	48	ND	<1	ND	<1	ND	<1	ND	<1	ND	<1	ND	<1	ND	<2	ND	<1
Floor 16 S	2372-33012-P18	ND	<1	1	1	1	1	6	6																
Floor 16 E	2372-33012-P29	ND	<1	1	1	ND	<1	9	6																
Floor 14 SE	2372-33012-P07	1	1	ND	<1	ND	<1	86	71																
Floor 14 N	2372-33012-P19	ND	<1	1	1	ND	<1	15	11	ND	<1	ND	<1	7	5	ND	<1	2	1	8	6	ND	<2	4	3
Floor 14 W	2372-33012-P30	ND	<1	1	1	1	1	20	15																
Floor 10 N	2372-33012-P08	ND	<1	2	1	1	1	7	5	ND	<1	ND	<1	ND	<1	ND	<1	ND	<1	ND	<1	5	4	ND	<1
Floor 10 E	2372-33012-P20	ND	<1	5	4	1	1	2	2																
Floor 10 W, void, tampered	2372-33012-P31	ND*	<1*	ND*	<1*	ND*	<1*	1*	1*																
Floor 8 S	2372-33012-P09	ND	<1	ND	<1	1	1	22	17																
Floor 8 N	2372-33012-P21	ND	<1	1	1	ND	<1	6	5	ND	<1	ND	<1	ND	<1	ND	<1	ND	<1	ND	<1	ND	<2	ND	<1
Floor 8 W	2372-33012-P32	ND	<1	1	1	ND	<1	35	27																
Floor 6 SE	2372-33012-P10	ND	<1	ND	<1	ND	<1	ND	<1	ND	<1	ND	<1	ND	<1	ND	<1	ND	<1	ND	<1	ND	<2	ND	<1
Floor 6 NW	2372-33012-P22	1	1	22	18	2	1	160	130																
Floor 6 S	2372-33012-P34	1	1	2	1	ND	<1	16	10																
Floor 4 SE	2372-33012-P11	ND	<1	1	1	ND	<1	8	6																
Floor 4 W	2372-33012-P23	ND	<1	1	1	ND	<1	10	9	ND	<1	ND	<1	ND	<1	1	1	1	1	ND	<1	ND	<2	ND	<1
Floor 4 N	2372-33012-P35	1	1	3	3	ND	<1	29	22																
Floor 2 SE	2372-33012-P12	ND	<1	6	3	ND	<1	12	7																
Floor 2 SW	2372-33012-P24	ND	<1	3	2	ND	<1	8	6																
Floor 2 N	2372-33012-P36	ND	<1	1	1	1	1	24	18	ND	<1	ND	<1	ND	<1	ND	<1	ND	<1	ND	<1	ND	<2	ND	<1
Exterior Northeast	2372-33012-P01	ND	<1	3	2	1	1	230	170	ND	<1	ND	<1	ND	<1	ND	<1	ND	<1	ND	<1	23	17	ND	<1
Exterior SW	2372-33012-P33	2	2	110	83	19	14	8,400	6,200	6	5	ND	<1	11	8	ND	<1	ND	<1	13	9	26	19	8	6
Lab Blank	2372-33012-Blank	ND	<1	ND	<1	ND	<1	ND	<1	ND	<1	ND	<1	ND	<1	ND	<1	ND	<1	ND	<1	ND	<2	ND	<1

PCR = Polymerase chain reaction SE = Spore equivalents ND = Not detected * = Void sample, pump was tampered with Outdoor sample Not analyzed Above outdoor level

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Monthly Air Monitoring Schedule

Floor	2011	2012											
	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Actual Date	12/30/11	1/27/12	2/24/12	3/30/12									
PH													
24	HTI	LCD	HTI	LCD	HTI	LCD	HTI	LCD	HTI	LCD	HTI	LCD	HTI
23	LCD	HTI	LCD	HTI	LCD	HTI	LCD	HTI	LCD	HTI	LCD	HTI	LCD
22	HTI	LCD	HTI	LCD	HTI	LCD	HTI	LCD	HTI	LCD	HTI	LCD	HTI
21	LCD	HTI	LCD	HTI	LCD	HTI	LCD	HTI	LCD	HTI	LCD	HTI	LCD
20	HTI	LCD	HTI	LCD	HTI	LCD	HTI	LCD	HTI	LCD	HTI	LCD	HTI
19	LCD	HTI	LCD	HTI	LCD	HTI	LCD	HTI	LCD	HTI	LCD	HTI	LCD
18	HTI	LCD	HTI	LCD	HTI	LCD	HTI	LCD	HTI	LCD	HTI	LCD	HTI
17	LCD	HTI	LCD	HTI	LCD	HTI	LCD	HTI	LCD	HTI	LCD	HTI	LCD
16	HTI	LCD	HTI	LCD	HTI	LCD	HTI	LCD	HTI	LCD	HTI	LCD	HTI
15	LCD	HTI	LCD	HTI	LCD	HTI	LCD	HTI	LCD	HTI	LCD	HTI	LCD
14	HTI	LCD	HTI	LCD	HTI	LCD	HTI	LCD	HTI	LCD	HTI	LCD	HTI
M													
11	LCD	HTI	LCD	HTI	LCD	HTI	LCD	HTI	LCD	HTI	LCD	HTI	LCD
10	HTI	LCD	HTI	LCD	HTI	LCD	HTI	LCD	HTI	LCD	HTI	LCD	HTI
9	LCD	HTI	LCD	HTI	LCD	HTI	LCD	HTI	LCD	HTI	LCD	HTI	LCD
8	HTI	LCD	HTI	LCD	HTI	LCD	HTI	LCD	HTI	LCD	HTI	LCD	HTI
7	LCD	HTI	LCD	HTI	LCD	HTI	LCD	HTI	LCD	HTI	LCD	HTI	LCD
6	HTI	LCD	HTI	LCD	HTI	LCD	HTI	LCD	HTI	LCD	HTI	LCD	HTI
5	LCD	HTI	LCD	HTI	LCD	HTI	LCD	HTI	LCD	HTI	LCD	HTI	LCD
4	HTI	LCD	HTI	LCD	HTI	LCD	HTI	LCD	HTI	LCD	HTI	LCD	HTI
3	LCD	HTI	LCD	HTI	LCD	HTI	LCD	HTI	LCD	HTI	LCD	HTI	LCD
2	HTI	LCD	HTI	LCD	HTI	LCD	HTI	LCD	HTI	LCD	HTI	LCD	HTI
1	LCD	HTI	LCD	HTI	LCD	HTI	LCD	HTI	LCD	HTI	LCD	HTI	LCD

Revised Protocol for Monthly Air Monitoring

1. The IH sampling teams will select an air sampling date which will be submitted to BOE for approval. Currently BOE has approved the last Friday of every month for the monthly air monitoring. BOE should also notify Building Security that hygienists will require escorts onto secure floors in order to install sampling pumps.

2. Each IH team will be responsible for collecting a minimum of three (3) air samples on each of the eleven (11) floors. The building HVAC system operating window is currently 5:00 AM - 6:00 PM; therefore the proposed sampling window is from 4:00 AM - 7:00 PM; the actual sampling window will be adjusted as seasonal adjustments are made to the HVAC system operating window.

3. Each air sample will be drawn over approximately 2 to 3 hours using a digital countdowm timer to initiate and terminate the sampling event; the first sampling event shall start 0500; the last (third) sampling event time ends by 1900. A target sample rate of 7 LPM; total sample volume of approximately 1200 liters; the above sampling time to be adjusted to meet the target volume.

4. Each IH team will collect one (1) exterior/outdoor sample per sampling period; for a total of three (3) exterior/outdoor samples per IH team per day.

5. Each sample will be collected, submitted under chain of custody, and analyzed for PCR-Cladosporium (Custom Panel) and one sample per floor analyzed for PCR-23, under standard turnaround time.

6. Air samples on Floor PH and M (which are not part of the regular sampling project schedule) may be added and collected at the direction of the DGS management team.

7. Air samples from Floors 2 and 21 core sampling ports (which are not part of the regular sampling project schedule) may be added and collected at the direction of the DGS management team. Type of samples TBD.

8. The combined IH teams will collect 66 interior + 6 exterior = 72 total air samples.

9. To demonstrate any seasonal changes within the HVAC duct interiors, surface microvac samples (which are not part of the regular sampling project schedule) may be added and collected at the direction of the DGS management team. Samples will be analyzed for *PCR-Cladosporium (Custom Panel) and for PCR-23*, under standard turnaround time.

10. Each month, within 7 working days of receiving the final laboratory analytical results, a written Summary Report (one electronic digital copy and four printed copies) shall be submitted to the DGS Project Manager.